AUTHOR INDEX

Abe, S. 69
Abubaker, M. 163
Adamse, P. 641, 645
Agarwal, R. 43
Akhobadze, V. 743
Al-Nabulsi, I. 201
Altenbach, C. 1019
Amit, R. 417
Anand, J. 441
Arnason, J. 479
Ashwood-Smith, M. 563
Assmann, S. 685
Asthana, A. 211
Athar, M. 43
Atlanta, A. 471

Bachowski, G. 1
Bakhiari, T. 263
Ballaré, C. 777
Baqer, A. 223
Baraldi, R. 541
Becker, R. 341
Behringer, F. 667
Beppu, Y. 1113
Berg, K. 177, 171, 333
Berinstain, A. 423
Bickers, D. 43
Birge, R. 935
Birge, J. 935
Black, H. 195
Bommer, J. 171
Bonenberger, J. 717, 771
Borkman, R. 1
Bousché, O. 1085
Boylan, M. 617
Braun, B. 751
Britz, S. 641, 645
Brody, S. 413
Brown, T. 385
Brożek, C. 287
Bryl, K. 1003, 1013
Bynoe, L. 353

Cao, Y. 1049
Carrier, W. 35
Casal, J. 571
Ceska, O. 563
Chader, G. 251
Chandok, M. 691
Chang, M. 1049
Charitopoulos, T. 57
Chen, Q. 379
Chen, X. 185
Chopp, M. 379
Chory, J. 833
Cline, S. 553
Colmenares, L. 101, 883
Compadre, C. 479
Compadre, R. 479
Cordonnier, M. 725
Cordonnier-Pratt, M. 709
Corson, D. 251
Cotton, T. 157, 263
Cristoferi, G. 541
Crouch, R. 251, 929

D'Sonza, F. 145
Das, A. 311
Davies, P. 667
Dearman, P. 623
Decout, J. 431
DeLuisi, J. 115
Dereski, M. 379
Deval, P. 1181
Devaraj, B. 281
Doolittle, W. 553
Druckmann, S. 977

Eaton, D. 297
Ebrey, T. 929
Edmonds, S. 505
Elmets, C. 43
Elsenberg, W. 441
Engelhard, M. 1073
Engelman, D. 895

Facini, O. 541
Fahmy, K. 1073
Farahbakhsh, Z. 1019
Farrens, D. 725
Ferraro, G. 413
Fielding, A. 623
Fork, D. 599
Forlot, P. 185
Franck, B. 271
Frederick, J. 123, 314
Friedman, N. 1041
Fujimura, K. 35
Fukada, Y. 995, 1157
Fukuda, K. 1057
Furukohri, T. 399

Galland, P. 847
Ganapathy, S. 959
Ganter, U. 57
Garcia-Pichel, F. 17
Geacintov, N. 463
Gebhard, R. 1035
Gensler, H. 25
Georghiou, S. 95
Gerguis, J. 195
Gessner, T. 513
Giba, A. 629
Giddens, L. 505
Gillespie, P. 287
Girotti, A. 1
Goldbeck, R. 953
Goldstein, J. 463
Görner, H. 371
Gottsch, J. 353
Govindjee, R. 929
Graham, E. 479
Groesbeek, M. 903, 1063
Grondelle, R. 529
Groot, H. 1035
Grubisic, D. 629
Gucinski, H. 35
Guron, K. 691
Gurzadyan, G. 371
Gutierrez, P. 201

Hampton, J. 235
Hanelt, S. 751
Hanson, K. 953
Harada, I. 1097
Hartman, R. 305
Hashimoto, S. 1097
Hass, C. 633
Hatano, Y. 977, 989
Hayami, J. 661
Hazard, E. 251, 929
Hellingwerf, K. 529
Henderson, B. 513
Hertel, R. 697
Hervás, M. 319
Hetzel, F. 379
Heyn, M. 1105
Hirata, H. 1167
Hirayama, J. 1129
Hobert, O. 585

Hoff, W. 529
Holloway, L. 229
Hoober, J. 245
Horowitz, B. 417, 463
Hott, J. 1
Hu, M. 357
Huang, C. 95
Hubbell, W. 434
Hudson, J. 479
Humblet, C. 883
Hunt, P. 579

Ichimura, T. 271
Ikenaga, M. 365
Imahori, T. 965
Imamoto, Y. 1129
Inaba, H. 271, 281
Ishida, M. 399
Ishizaki, K. 365
Ito, M. 915, 921
Iwasa, T. 921

Jakobs, A. 409
Janoudi, A. 655
Jeremić, M. 83
Ji, Y. 385
Jung, J. 63

Kadota, A. 661
Kagan, J. 185
Kahn, T. 895
Kakitani, H. 977, 989
Kakitani, T. 1113
Kamiya, K. 107
Kamo, N. 1129
Kaptein, R. 305
Kasperbauer, M. . . . 579, 823
Kasturi, C. 427
Kataoka, M. 895
Kataoka, T. 107
Kato, M. 365
Katsuta, Y. 915
Kawai, T. 107
Kawamura, S. 1173
Kawata, A. 1157
Kendrick, R. . . . 75, 607, 611
Kennedy, B. 133
Kerckhoofs, L. 611
Kessel, D. 51, 447
Khoka, M. 325
Khorana, H. 1085
Kim, C. 63
Kishigami, A. 909
Kliger, D. 953, 1135
Kobayashi, T. . . . 1003, 1013
Kolaczkowski, S. 157
Kollias, N. 223
Konjevic, R. 629
Kopp, H. 633
Korbellk, M. 391
Korytowski, W. 1
Kouyama, T. 1057
Koyama, Y. 965
Krebs, M. 1085
Kreiner, F. 115
Krishman, V. 145
Kristie, D. 623
Kusewitt, D. 287
Kwa, S. 529

Lamparter, T. 697
Lanyi, J. 1041, 1049
Larson, R. 211
Learn, D. 495, 505
Lee, D. 685
Lenger, W. 195
Lenny, L. 463
Lercari, B. 541, 651
Lewis, J. 1135
Ley, K. 287
Ley, R. 287
Lhomme, J. 431
Lind, T. 251
Lipson, E. 417, 667
Liu, R. 101, 427, 449
Lu, T. 263
Lugtenburg, J. 903
Lutterbüse, P. 697

Madslien, K. 177
Maeda, Akio 426
Maiti, M. 311
Malenfant, P. 423
Malkus, P. 685
Mancinelli, A. 585, 593
Margolis-Nunno, H. 463
Marles, R. 479
Marley, K. 211
Marx, S. 751, 765
Masuko, M. 107
Mathies, R. 857
Matsuda, N. 989
Matsumoto, K. 31
Matsunaga, T. 365
Matsuoka, T. 399
Maucher, P. 759
McCormac, A. 617
Merbs, S. 869
Michael, J. 325
Mimuro, M. 545
Mirzadegan, T. 883
Misra, B. 453
Misra, P. 325
Misra, H. 453
Miura, K. 1097
Moan, J. 171, 177, 333
Møller, S. 953
Moloney, S. 495, 505
Morand, P. 479
Moreno, G. 471
Moroni, A. 593
Mukai, Y. 965
Mukhtar, H. 43
Murakami, Y. 399

Nagoshi, T. 271
Nagpal, P. 833
Nakagawa, M. 1003
Nakamura, M. 403
Nandi, R. 311
Nathans, J. 869
Navarro, J. 319
Needleman, R. . . 1041, 1049
Ni, B. 1049
Nikaiko, O. 365
Nikas, G. 585

O'Neill, S. 789
Ogura, R. 31
Oishi, T. 1157
Okamoto, Y. 403
Okano, T. 995
Olla, B. 35
Olson, K. 1181
Oonuki, M. 567
Otto, H. 1105
Ottolenghi, M. 1041
Owczarczak, B. 513

Passarella, S. 471
Patterson, M. 379
Peters, J. 75
Picorel, R. 263
Piette, J. 409
Platz, M. 427
Poff, K. 655
Pou, P. 353
Pouwels, P. 305
Powell, M. 25
Powers, S. 385
Pratt, L. 709, 725

Qiu, K. 277, 489
Quail, P. 617

Radenović, Č. 83
Radosevich, S. 777
Radotić, K. 83
Rahn, R. 9
Rajagopalan, M. 287
Ramamurthy, V. 297
Rando, R. 1145
Rao, C. 523
Raser, L. 157
Reed, J. 833
Regan, J. 35
Reid, J. 667
Rich, M. 413
Ripka, W. 883
Roschger, P. 281
Rose, S. 305
Rosen, G. 353
Rossi, F. 593
Rothschild, K. 1085
Roux, S. 803
Rüdiger, W. 717, 789
Ryan, S. 287
Ryuzaki, M. 567
Rywkin, S. 463

Sadiq, I. 223
Salet, C. 471
Sanchez, R. 571, 777
Sanderson, D. 297
Sasaki, J. 1063
Sayre, R. 223
Scaiano, J. 423
Schalz, V. 51
Schendel, R. 717
Scheuerlein, R. 633, 759
Schneider, U. 271
Schneider-Poetsch, H. 697
Schraudolf, H. 759
Schreuder, M. 75
Schuster, H. 771
Scopel, A. 777
Scott, R. 281
Sekiya, N. 909
Selbert, M. 263
Selman, S. 235
Seret, A. 409
Sharp, W. 133
Sheves, M. 1041
Shi, M. 403
Shichida, Y. 995, 1129
Shopp, G. 287
Siebert, F. 57, 277, 489, 1073
Simpson, P. 25
Sineshchekov, V. 743
Sineshchekov, A. 667
Smith, H. ..... 509, 607, 611, ... 815, 717, 751, 765, 839
Smith, S. 1085
Sodi, F. 651
Sonar, S. 1085
Song, P. 725
Sopory, S. 691
Soucy-Breau, C. 479
Spears, K. 325
Sprott, G. 423
Spudich, J. 553, 1119, 1181
Stevenson, R. 441
Strulle, R. 413
Sugimoto, T. 545
Sugiyama, N. 107
Sugiyama, H. 107
Sugiyama, M. 31
Suzuki, S. 271
Sweeny, J. 513

Taiji, M. 1003, 1013
Takahashi, T. 909, 1119
Takamuku, S. 403
Takeda, J. 69
Takeuchi, H. 1097
Tallent, J. 935
Taneda, K. 399
Tappel, A. 357
Tarui, K. 107
Thorgeirsson, T. 1135
Thornby, J. 195
Thümmler, F. 771
Tittor, J. 1073
Tokunaga, F. 895, 909
Tokutomi, S. 545
Tollin, G. 319
Tomioka, H. 1035
Towers, G. 479
Traul, D. 277
Tsuda, T. 1167
Tsuda, M. 1003, 1167
Tsujiuchi, Y. 895
Tsuzaki, K. 31
Turnbull, M. 607
Tuveson, R. 211, 341

Uchiyama, S. 107
Usa, M. 271

VanderMeulen, D. 325
Verduin, S. 75
Virmaux, N. 57
Vorst, A. 409

Wada, M. 661
Wagner, G. 765
Wallace-Williams, S. 1135
Walstad, D. 385
Wandruszka, R. 163
Wang, Y. 709
Wang, T. 185
Wang, G. 341
Wang, S. 441
Warrington, P. 563
Watanabe, H. 271
Watanabe, N. 271
Weatherbed, E. 123
Weidlich, O. 1073
Wendell, J. 115
Wenderholm, E. 935
Western, A. 171
Whitcomb, K. 51
Whitelam, G. 617
Wicklund, R. 35
Wiggert, B. 251
Wilson, B. 379
Winands, A. 765

Yamagishi, T. 1097
Yamamoto, N. 245
Yamamoto, S. 245
Yan, B. 553, 1119
Yee, W. 953
Yoshida, H. 35
Yoshihara, K. 909, 995

Zang, L. 453
Zhang, C. 935
Zigler, J. 523
Zimányi,L. 1049

SUBJECT INDEX

absorption anisotropy 545, 661, 1105
absorption spectra 171, 869, 977
absorption spectrscopy 869
acclimation 685
acetyaldehyde 965
action spectra 63, 69, 171
activated oxygen . 1, 63, 83, 89, 353, 441, 453
adaptation 665, 667
aggregation 145, 171, 513
aging 495, 505, 641
agriculture 777
alcohol 1057
alkali-labile sites 185
amaranth 599
Amaranthus caudatus 599
amino acid sequences 717
amino acids 257, 717, 1073
anaerobic treatment 281
analogue pigment 921
ancestors 839
Anemia phyllitidis 633, 759
anoxic phase 281
anthocyanin synthesis 69, 75, 611
antibodies 641, 725, 709
antioxidants 357
antitumor agent 201
antiviral effect 479
Arabidopsis thaliana 417, 617, 665, 759
Archaebacteria 1119
aspartic acid 1073
atmosphere 133
Avena sativa 599, 697, 709, 771

back-photoreaction 1041
bacterial counting 107
bacteriorhodopsin .. 553, 895, 921, 929, 1097
bacteriorhodopsin mutant 1073
band shift 101, 661, 915
bathorhodopsin 1063
bean 599
bicycle retinal model 915
Bioluminescence 83, 89, 281, 567
bis(4-methoxyphenyl) 403
Blepharisma 399
blepharismin 399
blood plasma analysis 163
blue-absorbing pigments 541, 661
blue-light effects 645, 665, 667, 685
blue-light photoreceptors 541, 661, 685, 1097
blue-light responses 667
blue-membrane 1097

BOOK REVIEWS 143, 285
brain 379

calcium ions 667, 1173
calibration 133
cancer prevention 25
carbon dioxide 645
carbonylcyanide 553
carotenoids 263, 413
cataract 523
cell cycle 277
cell division 567
cell inactivation 171
cellular delivery 391
cellulose diacetate 641
charge-transfer complexes 145
chemiluminescence 281
chemotaxis 1119
chicken 859
chiral discrimination 915
chlorins 51
chlorophylls 281, 645
chloroplast membranes 263
cholesterol 1
chromophore configuration 101
chromophore orientation 567
chromophore structure 567
chromophores 101, 567, 803, 903 921
chromosomal aberration 31
chromosome transfer 365
circadian rhythms 789
circular dichroism band 915
cis-tran isomerization 959, 1003
citral 211
cleavage photon 567
collagen 505
color vision 859, 869, 995
COMMENTARIES .. 815, 823, 833, 839, 847
computer graphics 883
cone pigments 859, 869, 995
conformer 915, 953
corn oil 195
Corrigendum/Erratum 421, 1189
cotton 579
coumarin 623
cremophor 447
critical distance 725
crop improvement 815
crop physiology 777
cryptochrome 661
crystallin 257

Cucumis sativus 607, 645
Cucurbita 585, 593, 607, 697
Cucurbita pepo 585
cultured cells 69
cyclic GMP phosphodiesterase 1173
cyclobutane pyrimidine dimer .. 35, 305, 365
cyclosporin A 495
cynanobacteria 17
cytochrome *c* 353
cytotoxicity 31, 479

dark germination 633
Daucus carota 69
defense mechanisms 489
degradation 641
deoxyhemoglobin 223
deprotonation 1113
deuterated retinal 1063
diaziquone 201
dichroic orientation 661, 1105
diet 195
dihydropsoralen 431
dimers 35, 305, 325, 365, 567
4,4′ -dimethoxybiphenyl 403
1,4-diphenyl-1,3-cyclopentadiene 953
1,4-diphenylbutadiene 953
distribution pattern 51
DNA 31, 35, 185, 211, 341, 371, 495
DNA bases 371
DNA damage 31
DNA dosimeter 35
DNA strand cleavage 185
dose fractionation 489
dry matter partitioning 571
Dryopteris filix-mas 759
dyes 325

eggs 567
eicosanoids 513
elastin 505
electrochemical detection 9
electron transfer 145, 319
electrostatic interaction 909
elongation growth 571
embryo 709
emission spectra 281
endogenous rhythms 789
endosperm 709
endothelia cells 513
energetics 935
energy transfer 95, 325, 725
enhancement effects 665
Environmental photobiology 133
enzyme inactivation 63, 357
epidermis 677
Erratum (see also Corrigendum) 855
erythema 115, 229
erythrocyte 353
Escherichia coli 211, 341
ESIPT 311
etiolated seedlings 743
evolution 765
excited state absorption 953
excited state lifetime 529
excited states 83, 529, 935, 953, 977, 989
exicted state dynamics 977, 989
extension growth 611
extramembranous loops 895

far-red light 777, 823
Fe-S centers 63
femtosecond spectroscopy 1003
fern-spore germination 633
ferredoxin 319
filters 641
flash photolysis 1057
flavins 305
flavonoids 645, 777
florigen induction 789
flowering 789
fluence response curve 69
fluorescence .....
..... 95, 171, 403, 417, 447, 523, 725, 743
fluorescence anisotropy 95, 1105
fluorescence method 725
fluorescence spectra 95, 171
fluorescent cholesterol derivative 95
fluorinated retinals 909
fluorine NMR 101
fluororetinochrome 909
m-fluoro-tyrosine 929
Förster energy transfer 325
Fourlier transform 895, 977
frog 567
Fusarium sp. 211

g-protein coupling 883, 1167
g-proteins 883, 1167
gamma-II (γ-II) 257
gas phase oxidant 441
gecko 859
gene (oat phyA) 617
gene expression 759
germination 623, 633, 777
gibberellic acid 633
glutamic acid 1073
Gossypium hirsutum 579
group transfer 1145

growth 75, 571, 611, 645, 651, 709
guard cell 685

Haemophilus influenzae 341
Halobacterium halobium 929, 1181
halogens 9
heat 325
Helianthus annuus 599
helices 895, 1135
hematoporphyrin derivative 235, 245, 385, 413
heptahelices 1135
higher plants 651
hydrogen peroxide 89
hydrogen phosphate 403
hydrogne vibration 1063
hydrophobic cluster analysis 839
hydroxyl radicals 357
hypericin 157
hypochromism 431
hypocotyl growth 75
hypocrellin A 453
hypsorhodopsin 1063

image guide 107
immunocytochemistry 1157
immunopotentiation 245
immunoquantitation 709
indole-3-acetic acid 677
infra-red luminescence 409
infrared 883, 1063
infrared spectroscopy 895
interactions 431, 909, 1019, 1041, 1057
intermediates 529, 599, 1049, 1085
intermolecular electron transfer 145, 319
intramolecular excimer 403
iodide 9
iodopsin 859, 995, 1157
IRBP 299 cataract 257
irradiance 115
isomerization 803, 959, 965, 1003, 1145
isomerization mechannism 965
isomerohydrolase 1145
isopimpinellin 563
isotopic labeling 903

kinases 691, 1167
kinetic analysis 83

Lactuca sativa L. 623
lambda phage 427
laser irradiation 385
laser photolysis 319, 371, 1129
lasers 325, 385
leaf growth 645
leaves 281, 645
lens 257, 523
leukemia cells 277, 489
light beam 379
light quality 611
light scattering 379
light-adaptation 1013, 1173
linear dichroism 545, 1105
lipid peroxidation 1, 63, 89, 441, 453
lipid peroxides 89, 325, 1145
lipids 195, 325, 1145
lipophilicity 333
lipoproteins 51, 63
liposomal lysis 63
liposome damage 441
liposomes 63, 325, 441
luminol 89
lv gene 677
Lycopersicon esculentum 75, 599
lysis 325, 441
lysosomes 63, 177

M intermediate 1041
M-photointermediate 929
macrophage activation 245
magic angle spinning 1035
maize 599, 685, 691
malondialdehyde 453
marine organisms 35
membrane phospholipids 1145
membranes ..... 1, 263, 697, ... 929, 1045, 1057, 1085, 1097, 1135, 1145
menhaden oil 195
merocyanine-540 489
mesotetraphenylporphine 177
meta-retinochrome 909
meta-rhodopsin 1035, 1135
5-methoxypsoralen 529, 563
micelles 447
micropolarity 297
microtubules 333
minimum erythemal dose 229
mitochondria 471
mitosis 333
molar extinction 995
molecular biology 789
molecular orbitals 935, 1113
monoclonal antibodies 709
morphogenesis 759
Mougeotia 765
mouse macrophages 245
multiphoton effect 325
murine cytomegalovirus 479
murine mastocytoma 297

mutants 341, 417, 607, 677, 815, 895
mutation 31, 895, 1073

NADH 523
NADPH 523
nanosecond spectroscopy 325
Natronobacterium pharaonis 1129
near UV light 341
neighboring vegetation 585
nitrates 633
nitric oxide 513
NMR 903
nonprotonated species 909
Northern blot analysis 759

O-intermediate 1085
oats 599, 697, 709, 771
octopus 1167
opsin shift 101, 915
optical dose 379
optical dosimetry 379
optical fibers 107
organic nitrates 629
oxyhemoglobin 223
ozone 35, 115, 123, 133
ozone depletion 35

Para-dimethylaminobenzonitrile 297
partitioning 823
Paulownia tomentosa 629
pBR322 DNA 185, 211, 341
pea 677, 743
peroxidation 1, 63, 89, 441, 453
peroxyradicals 83
pH dependence 311, 1097
phagocytosis 245
Phaseolus vulgaris 599
phoborhodopsin 1119
phosphatidylcholines 441
phospholipid vesicles 63, 257, 325, 441
phospholipids 195, 325, 1145
phosphorylation 1167
photo-CIDNP 305
photoactivation 553
photoactive yellow protein 529
photoaddition 431
photoaging 495, 505
Photobacterium 107
photochemical properties 895
Photochemistry 1, 9, 271, 305, 403, 409, 431, 441
photochrome 789
photoconversion 593
photoconversion kinetics 593
photocycle intermediates 529
photocycles 529, 895, 1013, 1041, 1049, 1129, 1145
photodamage 17, 523
photodynamic effects 271, 463
photodynamic therapy 177, 235, 245, 379, 513
photofrin 391, 513
photofrin II 513
photoionization 371
photoisomerization 959, 965
photolysis 257, 1135
Photomedicine 43, 51, 235, 245, 287, 379, 385, 391, 505, 513
Photomorphogenesis 69, 75, 417, 545, 571, 579, 585, 593, 599, 607, 611, 617, 623, 629, 633, 641, 645, 651, 655, 661, 667, 677, 697, 685, 691, 709, 717, 725, 735, 743, 751, 759, 765, 771, 777, 789, 803, 811, 815, 823, 833, 839, 847
photomorphogenic mutant 607, 677
Photomovement 399, 553
photon counting camera 107
photooxidation 271
photoperiodism 789
photophysical probes 297
photophysics 935
(6-4) photoproducts 365
photoprotection 17, 413, 523
photoreaction cycle 1129
photoreactivation 35
Photoreception 63
photoreceptors 399, 1157, 1167
photoregulation 691
photoresponses 607, 617, 677, 1119
photoreversibility 803
photorhodopsin 1129
photoselection 95, 1105
photosensitivity 995
Photosensitization 171, 177, 277, 333, 341, 353, 413, 453, 463, 479, 489
photosensitizers 1, 51, 63, 171, 177, 201, 235, 245, 333, 385, 391, 413, 427, 513
Photosynthesis 263, 319
photosystem I 319
phototaxis 1119
Phototechnology 107, 163, 325, 423
phototoxicity 211, 271, 341, 479
phototransduction 691, 839, 1119, 1173
phototransformation 725, 743
phototropism 661, 665, 667
phthalocyanines 171, 333, 463, 513
phycobiliprotein 803
phycocyanin 803
Phycomyces 667

972326

phytochrome .. 541, 545, 585, 593, 599, 607, ... 623, 629, 633, 651, 665, 677, 691, 697, . 709, 717, 725, 759, 771, 777, 803, 815, 839
phytochrome (lower plants) 759
phytochrome ecology 599
phytochrome evolution 839
phytochrome expression 771
phytochrome fusion proteins 717
phytochrome states 743
phytochrome tetrapyrrole 803
phytochrome-B 607
phytochrome-modulation 69
phytochrome-protein sequence 759
picosecond spectroscopy 325
pigments 17, 541, 661
Pisum 677, 743
planar conformation 915
plant canopy 777
plant competition 777
plasmid DNA 185
platelets 513
poly(dG-dC) poly(dG-dC) 95
polychromatic spectrometer 89
polyenes 935, 953
polyester 641
polymerase chain reaction 759, 765
polynucleotides 371
polyphosphoinositides 691
polyporphyrin 385
porphyrin sensitization 427
porphyrins 177, 333, 427
preactivation 271
presolarizing effect 641
primary photoprocesses 803, 1003
primary photoreactions 803
prolonged far-red light 823
protein carbonyls 357
protein structure 921, 1097
proteolytic fragments 717
proton acceptors 965, 1073
proton pump 895, 929, 1049, 1057
proton transfer 1057, 1085
protonation 965, 1113
Protonema (fern) 661
protoplasts 771
protozoa 413
proximity perception 815
Prunus cerasus 541
psoralens 185, 409
Pteridophyta 661, 759
purple membrane 929, 1057, 1085, 1097, 1105
pyranine 1181
pyrene 297
pyrenealdehyde 297
pyrimidine dimers 35, 305, 365
pyrimidines 9

quantum yield 409, 965, 995
quenchers 463

R-ring diene 163
rabbits 463
radiation 113, 123, 133
radical generation 145
radicals 83, 201, 353, 453
Raman spectroscopy 157, 263, 1097
RAPID COMMUNICATIONS 287, 423, 427
rate constants 883
red blood cells 463
red/far-red perception 585
red light 633, 823
reduced nucleotides 523
reflected light 585, 823
regeneration 771, 1145
RESEARCH NOTES 95, 101, 271, 277, 281, 403, 409
resonance 1035
resonance Raman 157, 263, 1097
retention 177, 391
retina 859, 1157
11-*cis* retinal 935
retinal proteins 529, 977, 1003, 1129
retinals ... 903, 921, 935, 959, 977, 1105, 1181
retinochrome 909, 965
retinoids 257
retinol 257
retynylidene 257
REVIEW ARTICLES 777, 789, 803, 811
rhodamine 123 471
rhodopsin ..... 101, 859, 883, 915, ... 965, 995, 977, 1003, 1019, 1035 ..... 1063, 1113, 1119, 1145, 1157, 1167
rhodopsin analogue 101, 915
rhodopsin modeling 883
Robertson-Berger meter 115, 133
rotamer 953
RT-2 glioma 385

S-modulin 1173
sanguinarine 311
Schiff base deprotonation 1073
Schiff's base 909, 965, 1049, 1063, 1073, 1113
Schizaeaceae 633
seed 709
selenopsoralen 409
sensory rhodopsin 1119, 1181
sensory rhodopsin-I 1181
sera 391

SERRS spectroscopy 263
shade avoidance 585, 607, 611, 815
shadow rule 229
signal transduction 691, 839, 1119, 1173
Sinapis (internode growth) 571
Sindbis virus 479
singlet excited state 959
singlet oxygen 1, 63, 89, 441
singlet oxygen quenching 441
singular value decomposition 1135
site-directed mutagenesis 895, 1049
Skh-1 hairless mice 505
skin cancer 25, 195
skin thickness 505
skotodormancy 623
solvent effects 935
soybean 89
spectrophotometric assay 585
Spectroscopy ... 145, 157, 297, 311, 319, 447
spin label 1019
spin trapping 453
spinach 263
split-dose 177
stem elongation 651, 677
stomata 685
structure comparison 839
structure-activity relationships 479
sulfhydryls 357
sun protection 119
sunflower 599
sunscreens 17
supercage 297
supercoiled DNA 185
superoxide 353, 453
synchronous scan 523

TECHNICAL NOTES .....
..... 107, 113, 115, 123, 133, 413, 417
temperature effects 311, 325, 623
α-terthienyl 479
thiophenes 479
thiopsoralen 409
thymine 431
time-resolved infrared 1085
tissue slices 235
α-tocopherol 257, 341
tomato 75, 297, 599
transforming DNA 495
transgenic moss 771
transgenic plants 617, 815
transition dipole 1105
transmembrane helices 895
transmitter module 839
triplet carbonyl 89
triplet state 89, 959
tris (4-methoxyphenyl) phosphate 403
Triticum aestivum 599
tryptophan 1097
tumor promotion 25
tumoricidal activity 245
twisted conformation 915
two dimensional photon-counting 89
tyrosine 929, 1097

Ultraviolet effects 17, 25, 31, 35, 95, 185,
. 195, 201, 211, 233, 357, 365, 371, 495, 563
unprotonated species 965
UV photoreceptors 69, 651
UV radiation .....
..... 9, 17, 25, 105, 113, 115, 123, 223, 651
UV-B 35, 133, 219, 777
UV-B sources 641
UVA 357

validation 133
very low fluence 777
virus inactivation 271, 463
Vision 57, 101, 251, 257, 523, 529,
.... 833, 859, 869, 895, 903, 909, 915, 921,
.... 929, 935, 953, 959, 965, 977, 989, 995,
.. 1003, 1005, 1013, 1019, 1037, 1041, 1049,
.. 1057, 1063, 1073, 1085, 1105, 1113, 1119,
.. 1129, 1135, 1145, 1157, 1173, 1167, 1181
visual chromophores 903,
.. 909, 921, 935, 959, 977, 1005, 1181, 1135
visual cycle . 529, 895, 1013, 1041, 1129, 1145
visual pigments 859, 903, 977, 989, 1129, 1135
vitamin A 257
vitamin E 31

wavepacket propagation 989
Western blot 717
wheat 599

XP-A cells 365
XPAC gene 365

Zea mays 599, 685, 691
zeolite 297
zinc complex 163
zucchini 585
zwitterion formation 311
Zygnematophyceae 765